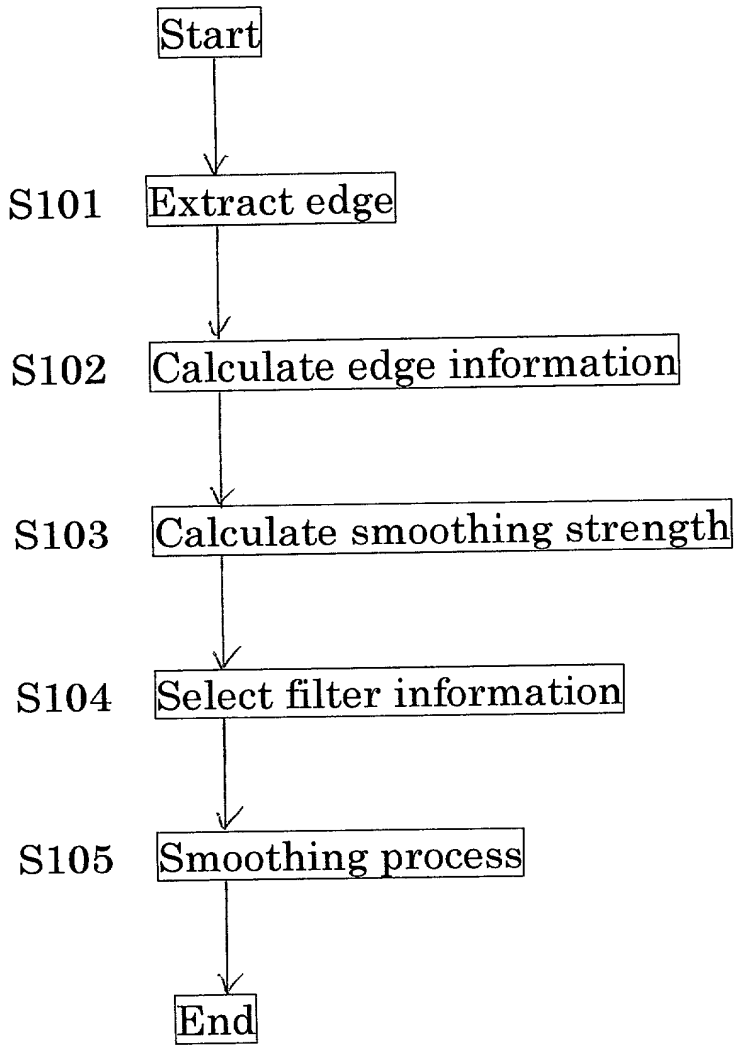
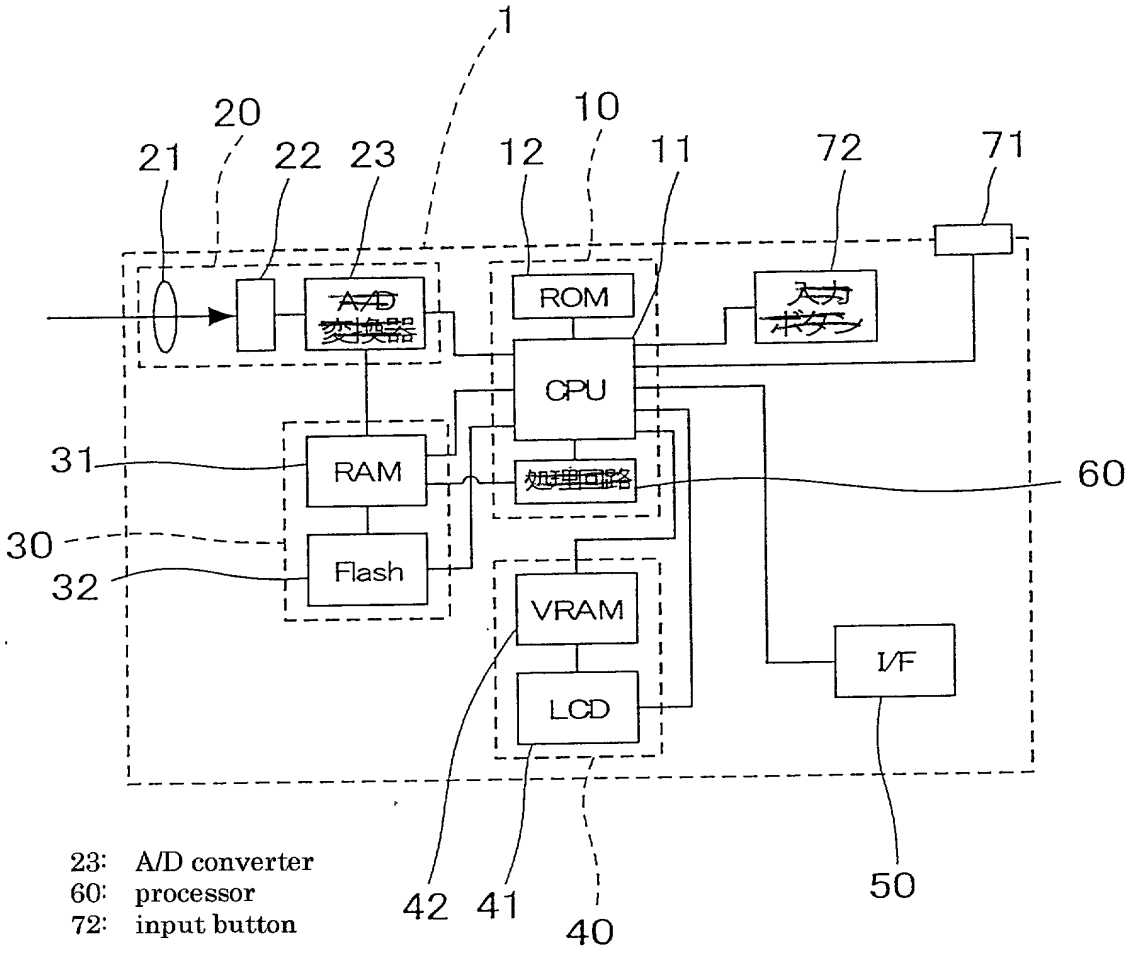
Fig. 1


Start
S101
Extract edge
S102
Calculate edge information
S103
Calculate smoothing strength
S104
Select filter information
S105
Smoothing process
End



23: A/D converter
60: processor
72: input button

FIG.2

FIG.3

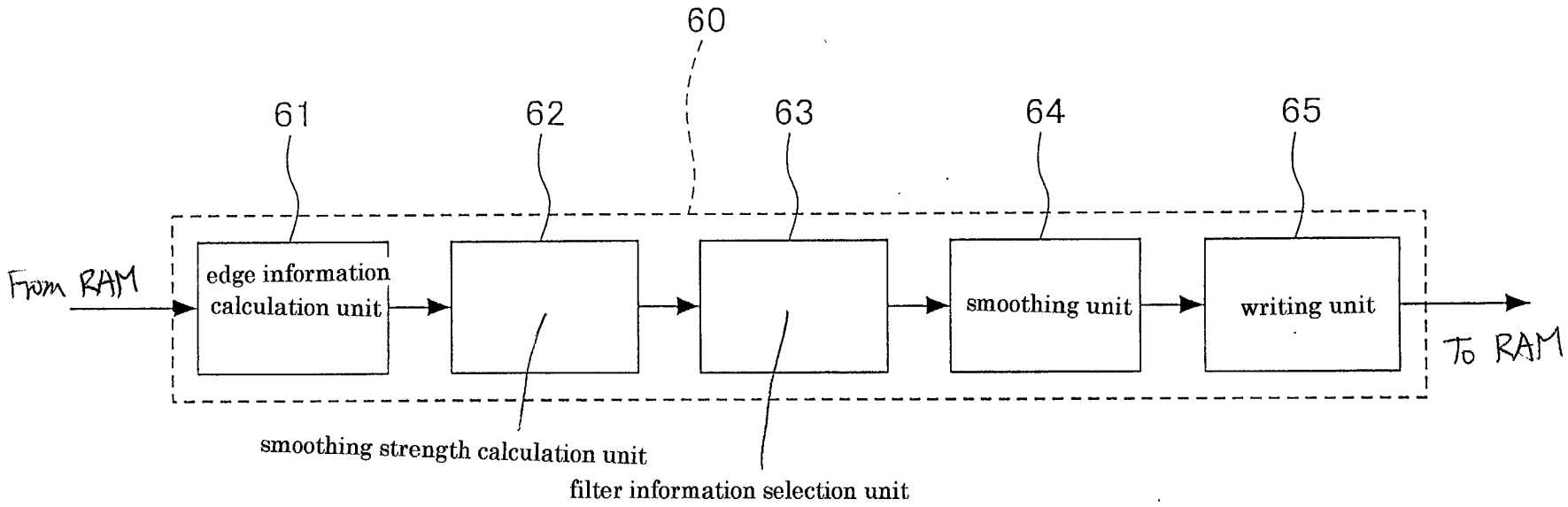
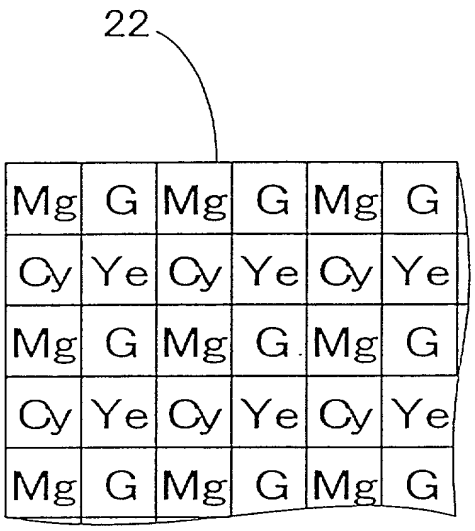

60
61
62
63
64
65
From RAM
edge information calculation unit
smoothing unit
writing unit
To RAM
smoothing strength calculation unit
filter information selection unit

FIG.4


22
Mg G Mg G Mg G
Cy Ye Cy Ye Cy Ye
Mg G Mg G Mg G
Cy Ye Cy Ye Cy Ye
Mg G Mg G Mg G

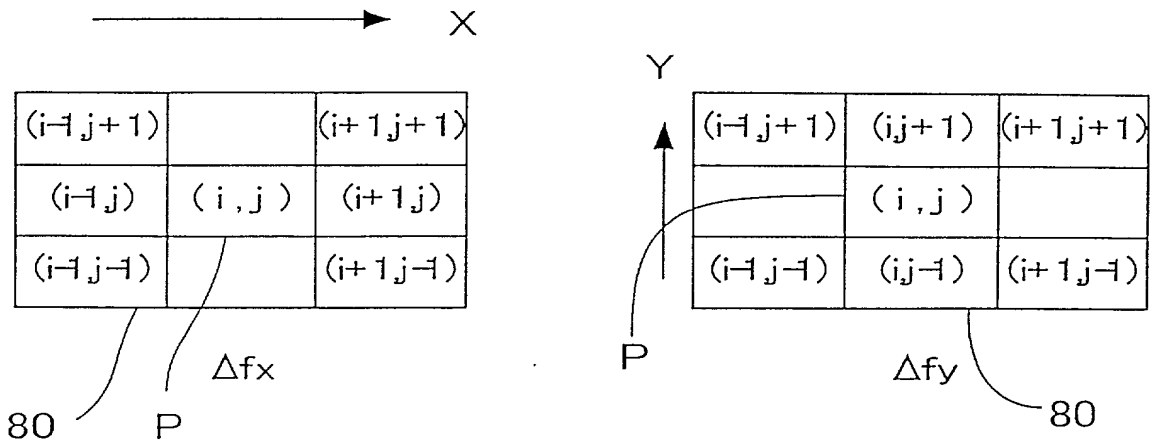
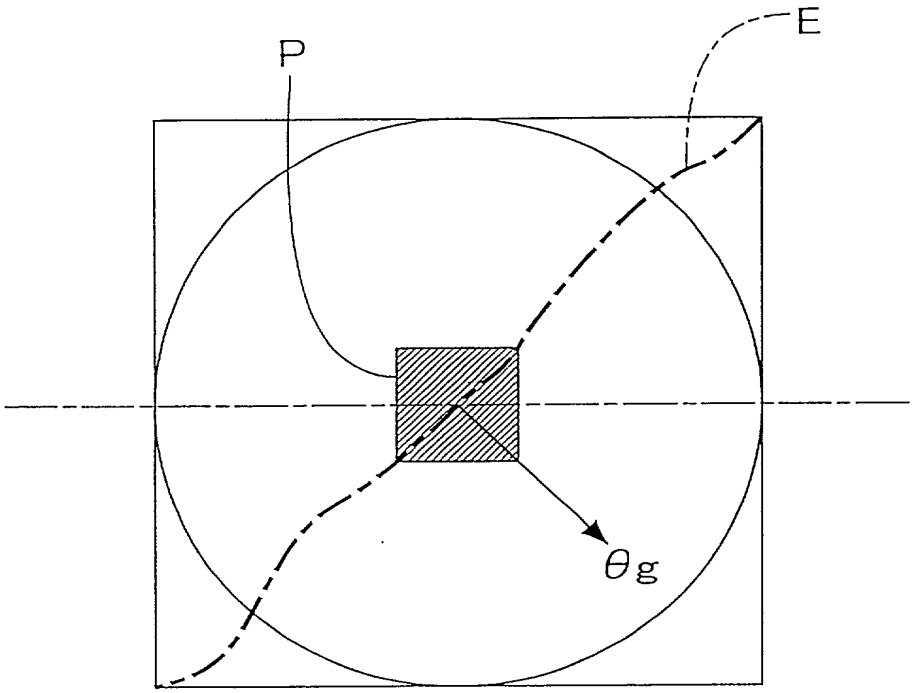

X
(i−1,j+1)
(i+1,j+1)
(i−1,j)
(i,j)
(i+1,j)
(i−1,j−1)
(i+1,j−1)
Δfx
80
P
Y
(i−1,j+1)
(i,j+1)
(i+1,j+1)
(i,j)
(i−1,j−1)
(i,j−1)
(i+1,j−1)
P
Δfy
80

FIG.5

FIG. 6



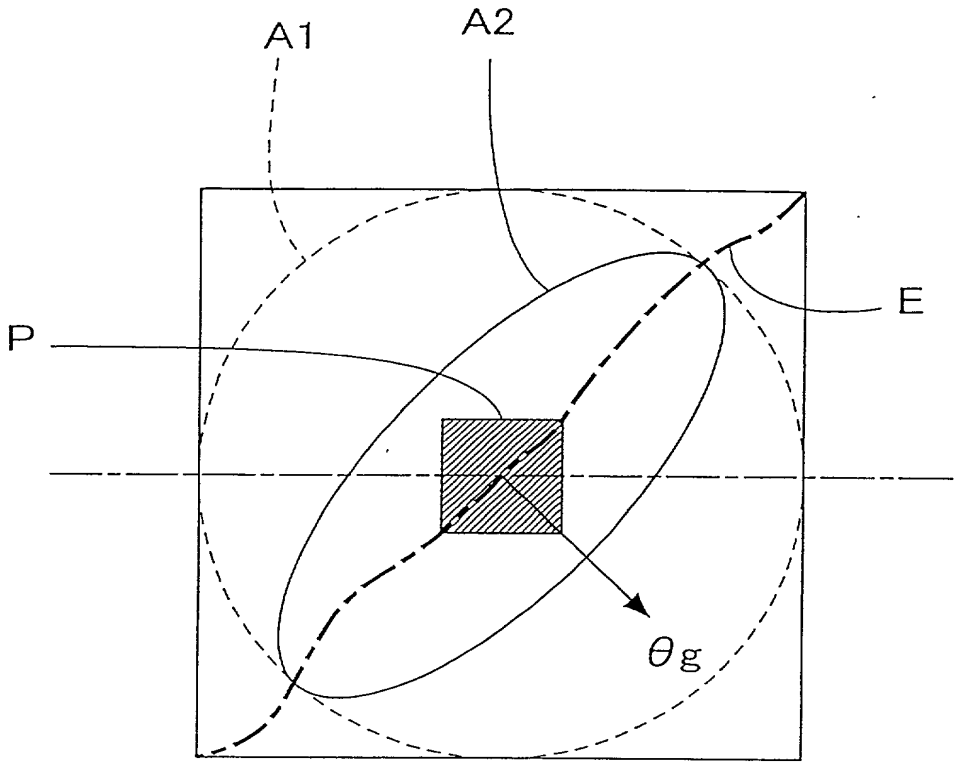


FIG.7

n = 1

0	1	1	1	0
1	11	30	11	1
1	30	83	30	1
1	11	30	11	1
0	1	1	1	0

/259

n = 1.5

0	0	0	0	0
0	16	24	1	0
0	24	215	24	0
0	1	24	16	0
0	0	0	0	0

/254

n = 2

0	0	0	0	0
0	21	13	0	0
0	13	162	13	0
0	0	13	21	0
0	0	0	0	0

/256

n = 2.5

0	0	0	0	0
0	24	5	0	0
0	5	188	5	0
0	0	5	24	0
0	0	0	0	0

/256

n = 3

0	0	0	0	0
0	26	1	0	0
0	1	199	1	0
0	0	1	26	0
0	0	0	0	0

/255

n = 3.5

0	0	0	0	0
0	26	0	0	0
0	0	202	0	0
0	0	0	26	0
0	0	0	0	0

/254

FIG.8

σ=0.5 , n=1 , m=1 , θg=45°

0	0	0	0	0
0	3	21	3	0
0	21	158	21	0
0	3	21	3	0
0	0	0	0	0

/254

σ=0.5 , n=3 , m=1 , θg=45°

0	0	0	0	0
0	5	0	0	0
0	0	247	0	0
0	0	0	5	0
0	0	0	0	0

/257

σ=0.7 , n=1 , m=1 , θg=45°

0	1	1	1	0
1	11	30	11	1
1	30	83	30	1
1	11	30	11	1
0	1	1	1	0

/259

σ=0.7 , n=3 , m=1 , θg=45°

0	0	0	0	0
0	26	1	0	0
0	1	199	1	0
0	0	1	26	0
0	0	0	0	0

/255

σ=0.8 , n=1 , m=1 , θg=45°

0	1	3	1	0
1	13	29	13	1
3	29	64	29	3
1	13	29	13	1
0	1	3	1	0

/252

σ=0.8 , n=3.5 , m=1 , θg=45°

0	0	0	0	0
0	37	1	0	0
0	1	177	1	0
0	0	1	37	0
0	0	0	0	0

/255

σ=0.9 , n=2 , m=1 , θg=45°

0	2	4	2	0
2	15	27	15	2
4	27	51	27	4
2	15	27	15	2
0	2	4	2	0

/251

σ=0.9 , n=4 , m=1.25 , θg=45°

0	0	0	0	0
0	28	1	0	0
0	1	195	1	0
0	0	1	28	0
0	0	0	0	0

/255

σ=1.0 , n=1 , m=1 , θg=45°

1	3	6	3	1
3	15	25	15	3
6	25	41	25	6
3	15	25	15	3
1	3	6	3	1

/253

σ=1.0 , n=4.5 , m=1.5 , θg=45°

0	0	0	0	0
0	22	1	0	0
0	1	209	1	0
0	0	1	22	0
0	0	0	0	0

/257

FIG.9

90

0	0	0	0	0
0	28	1	0	0
0	1	195	1	0
0	0	1	28	0
0	0	0	0	0

FIG.10

FIG.11

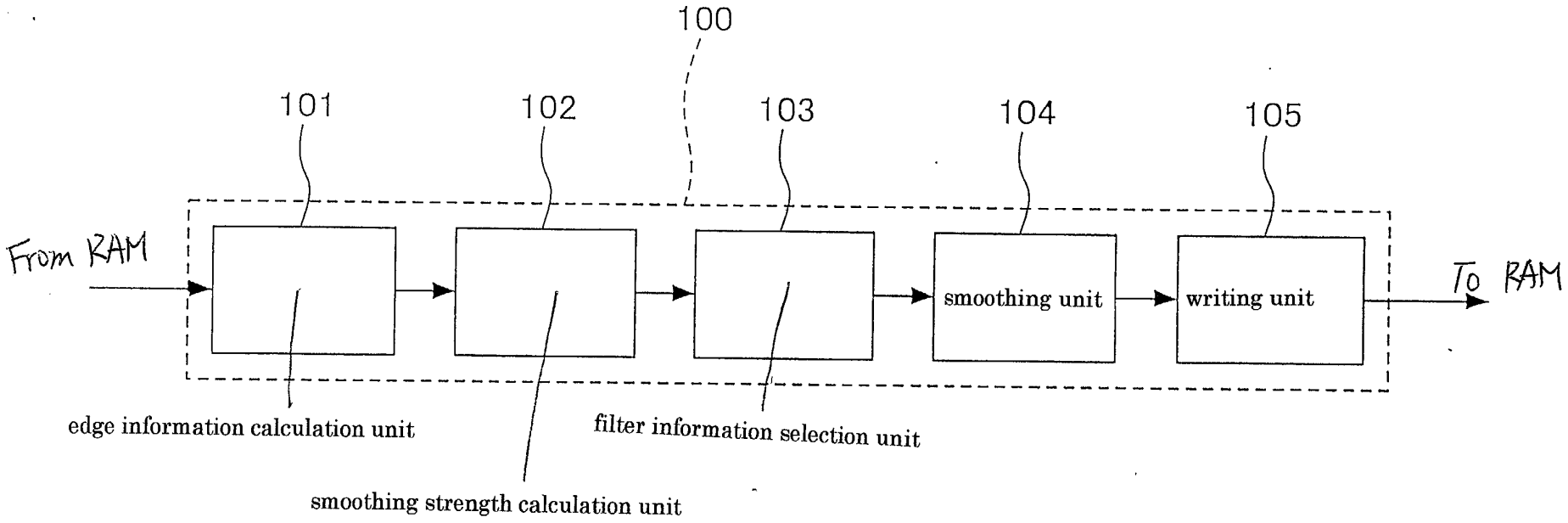
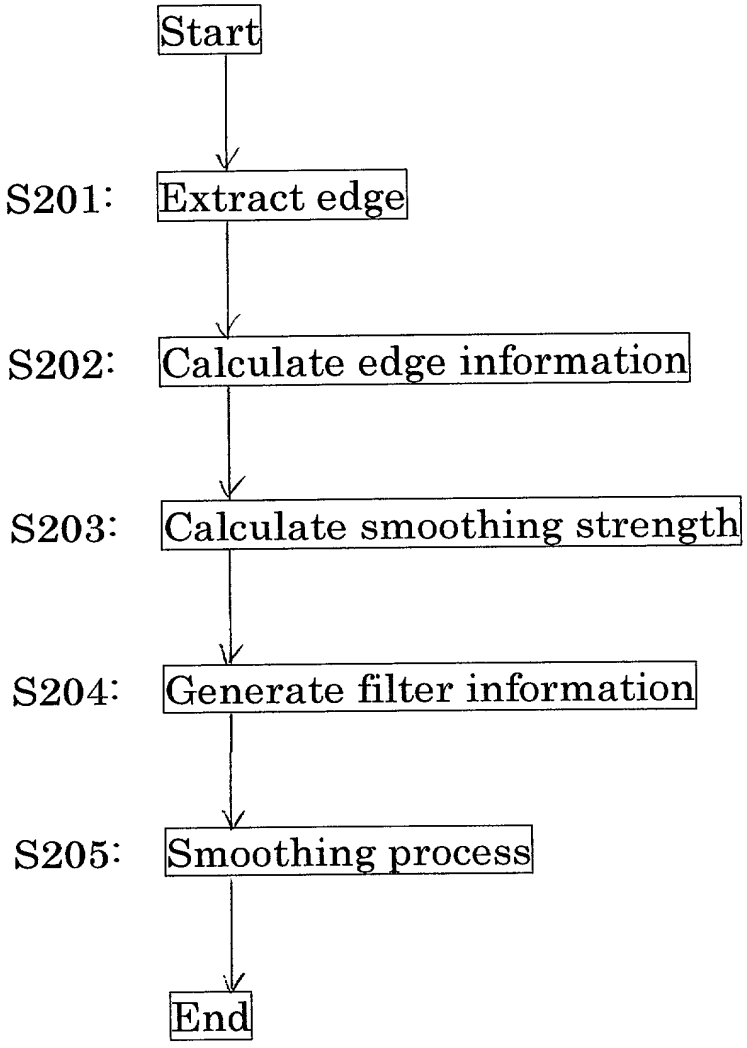

100
101
102
103
104
105
From RAM
To RAM
smoothing unit
writing unit
edge information calculation unit
smoothing strength calculation unit
filter information selection unit

Fig. 12


Start
S201:
Extract edge
S202:
Calculate edge information
S203:
Calculate smoothing strength
S204:
Generate filter information
S205:
Smoothing process
End